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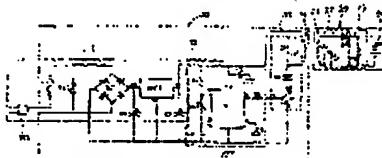
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权利要求书 1 页 说明书 4 页 附图页数 4 页

[54] 发明名称 无接点的电池充电装置

[57] 摘要

本发明是一种无接点的电池充电装置，主要包括一充电器与一充电电池组，该充电器具有一整流回路，该整流回路再并接一振荡回路与一驱动回路，该驱动回路更串接一个一次感应线圈，另外，该充电电池组具有一个二次感应线圈，该二次感应线圈串接一整流回路而且并接一滤波回路后再与一充电电池相并接。



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## 权 利 要 求 书

1. 一种无接点的电池充电装置，包括一充电器与一充电电池组，其中该充电器包括可提供一预定直流电压的一电源回路，而该充电电池组则包括一滤波回路以及一充电电池，其特征在于：

该充电装置还包括：

与电源回路并接并且将直流电压转为直流脉动电压的振荡回路；

与振荡回路并接并且将直流脉动电压驱动放大的驱动回路；

与驱动回路并接而且可获得驱动回路的直流脉动电压，并以电磁诱导方式传递其电能的一次感应线圈；

该充电电池组还包括：

可感应接收外部电能的二次感应线圈；以及

与该二次感应线圈线路相接并且将二次感应线圈所获得的电压加以整流的整流回路；

该滤波回路与该二次感应线圈线路并接并且将二次感应线圈所获得的电压加以滤波，形成一稳定的直流电压；

该充电电池也与二次感应线圈的线路并接而且储存二次感应线圈所感应接收的电能。

2. 根据权利要求1所述的无接点的电池充电装置，其特征在于：该一次感应线圈与二次感应线圈都是呈薄片状。

## 说 明 书

### 无接点的电池充电装置

本发明有关于一种电池充电装置，特别是有关于一种无接点的电池充电装置。

由于现代社会的进步，无线式的电化产品(如遥控器、无线电话、无线滑鼠等)由于使用方便，已渐渐普及于每个家庭的中且颇受欢迎，而无线电化产品往往必须藉由一充电装置来随时提供产品本身所需的电力，而在以往的电池充电装置中，请参阅图1所示，是藉由一充电器1的接点101、102与一充电电池2的接点201、202相接触而导电，使充电器1的电源可传输至充电电池2上，达到充电的目的，但是，该充电器1的接点101、102与充电电池2的接点201、202容易因为接点氧化或变形等因素而造成接触不良，使得充电电池充电效果不佳，甚至无法充电。

本发明的主要目的在于提供一种不需要接点就可以将充电器的电力传输至充电电池内，达到充电的目的的无接点电池充电装置。

本发明所提供的一种无接点的电池充电装置包括有一充电器与一充电电池组，该充电器具有可提供一预定的直流电压的电源回路；与电源回路并接并且将直流电压转为直流脉动电压的振荡回路；与振荡回路并接并且将直流脉动电压驱动放大的驱动回路；与驱动回路并接并且可获得驱动回路的直流脉动电压的一次感应线圈。该充电电池组则包括可感应接收外部的电压的二次感应线圈；与该二次感应线圈线路相接并且可将二次感应线圈所获得的电压予以整流的整流回路；与该二次感应线圈线路并接，可将二次感应线圈所获得的

电压予以滤波，形成一稳定直流电压的滤波回路；与二次感应线圈的线路并接，将二次感应线圈所感应接收的电压予以储存以获得电力的充电电池。

下面通过較佳实施例及附图对本发明的无接点的电池充电装置进行详细说明，附图中：

图式的简单说明：

图 1 是以往接点式充电器与充电电池的动作方块图。

图 2 是本发明較佳实施例的线路图。

图 3 是本发明上述較佳实施例的动作方块图。

图 4 是本发明上述較佳实施例使用于无线滑鼠与其充电座的示意图。

请配合参阅图 2 所示，本发明无接点的电池充电装置，包括一充电器 10 与一充电电池组 20。

该充电器 10 包括有一电源回路 11、一振荡回路 12、一驱动回路 13 与一个一次感应线圈 14。

该电源回路 11 可以将一外部交流电压转为预定直流电压，或直接将外部供应的纯直流电压转为一预定直流电压，于本实施例中，是将一外部交流电压转为预定直流电压。该电源回路 11 具有一外接交流电的插头 111，並且该电源回路 11 具有一桥式整流器 BD1、一转换器 HIC1 (AC/DC CONVERTER) 以及电容 C1、C2，以便将外部交流电压转为直流电压，提供一预定的直流电压。

该振荡回路 12 与插头 111 的线路连接，由一振荡器 U1 与电阻 R1、R2、电容 C3、C4、C5 所组成，可将直流电压转为脉动电压而由电阻 R2 端送出。

该驱动回路 13 与振荡回路 12 相并接，由一电容 C6、二极管 D1 与一晶体管 Q1 相串接而成，其中该晶体管 Q1 的基极端 B 与振荡回

路 12 的电阻 R2 相接，可用来驱动放大电压。

该一次感应线圈 14 呈薄片状而且与驱动回路 13 并接，可被驱动回路 13 驱动而获得一直流脉动电压，并且可以电磁诱导方式传递其电能。

而该充电电池组 20 包括有一个二次感应线圈 21、一整流回路 22、一滤波回路 23 与一充电电池 24。

该二次感应线圈 21 呈薄片状，而且可感应接收外部的电压。

该整流回路 22 与该二次感应线圈 21 的线路相接，主要是由一电容 C7 与一个二极管所 D2 组成，可将二次感应线圈 21 所获得的电压予以整流。

该滤波回路 23 与该二次感应线圈 21 的线路并接，是一电容 C8，可将二次感应线圈 21 所获得的电压予以滤波，形成一稳定的直流电压。

该充电电池 24 也与二次感应线圈 21 的线路并接，将二次感应线圈 21 所感应接收的电压予以储存以获得电力。

以上是本发明无接点的电池充电装置组件相关联构造及位置的说明，接着，本发明的动作原理及所能预期达成的功效说明如下。

请同时配合参阅 3 图所示，当该充电电池 24 要充电时，可将该充电电池组 20 的二次感应线圈 21 与充电器 10 的一次感应线圈 14 相对应靠合，如此，该电源回路 11 将交流电压转为直流电压后再送至振荡回路 12，并且将直流电压转为脉动电压。再藉由驱动回路 13 的作用，使一次感应线圈 14 可获得振幅较大的直流脉动电压，而该充电电池组 20 的二次感应线圈 21 则藉由电磁诱导方式使充电器 10 的一次感应线圈 14 电压感应至该充电电池组 20 的二次感应线圈 21，该二次感应线圈 21 再将直流脉动电压经由整流回路 22 与一滤波回路 23 的作用，将适当的电能传输至充电电池 24 内直到充电饱和，达到

充电的目的。

请再参阅图4，是本发明应用于一无线滑鼠30与其充电座40的使用示意图，该无线滑鼠30内设有该充电电池组20，其中，该二次感应线圈21设于无线滑鼠30底面，充电座40内设有该充电器10，而该一次感应线圈14设于充电座40的顶面上并与二次感应线圈21相对应。当该无线滑鼠30置于充电座40上时，该充电电池(24)可以经由一次感应线圈14与二次感应线圈21的电磁诱导作用而达到充电的目的。

所以，因为本发明的无接点电池充电装置是藉由一次感应线圈14与二次感应线圈21的电磁诱导作用而达到充电目的，所以不需要藉由接点导通充电，可以免除以往充电器易因为接点氧化或变形等因素造成接触不良的缺点，而可应用于需要充电的任何产品，包括无线电子化产品，如无接点充电遥控器。

## 说 明 书 附 图

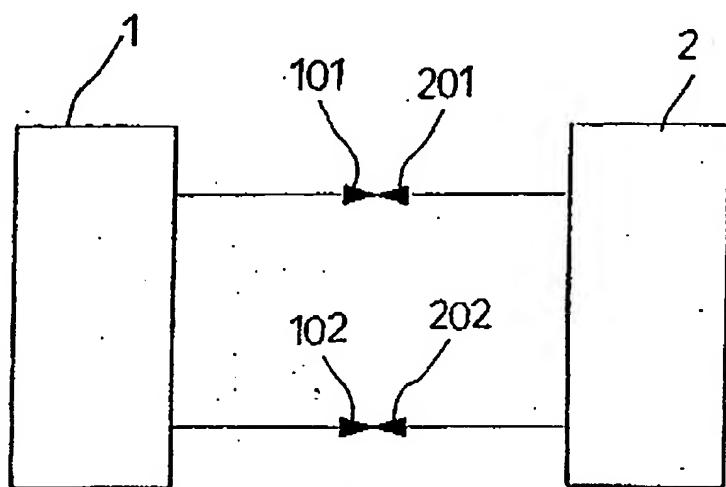
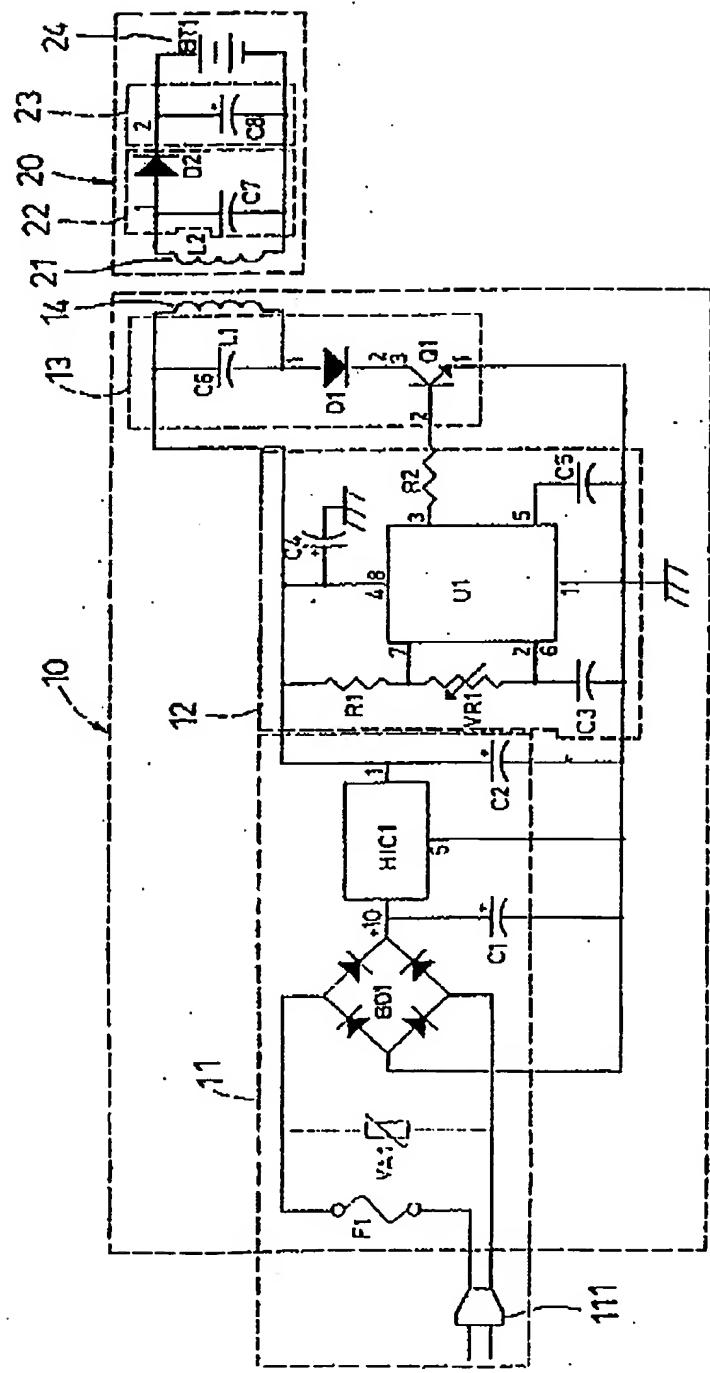


图 1



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图2

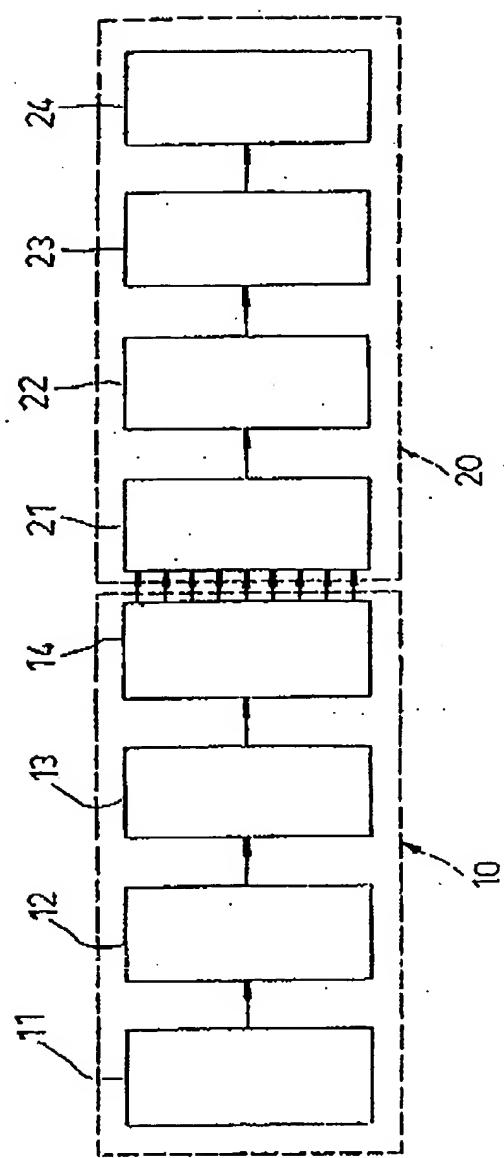


圖 3

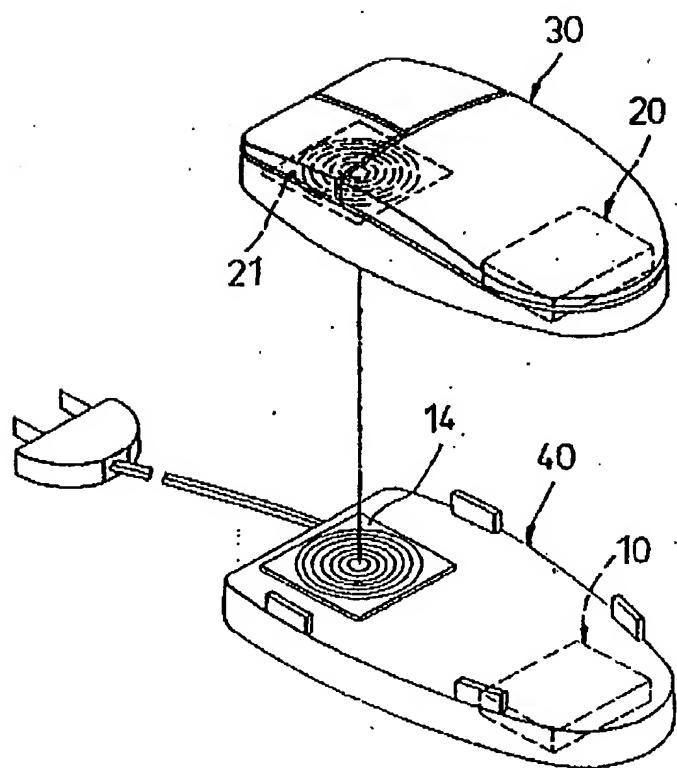


图 4

PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

5 Applicant: Shih-Sheng Huang

Filing Date: 07/04/2002 Art Unit: 2673

Serial No.: 10/064,357 Docket No.: PMXP0142USA

10 Title: WIRELESS PERIPHERALS CHARGED BY ELECTROMAGNETIC  
INDUCTIONTo: The Commissioner of Patents  
P.O. BOX 1450  
Alexandria, VA 22313-145015 Subject: Preliminary amendment for the above-identified  
application.

Dear Sir:

20 **INTRODUCTORY COMMENTS**Claims 1 and 7 are amended to overcome the similarity of a  
prior art cited by the State Intellectual Property Office  
of People's Republic of China. No new matter is introduced  
25 by this amendment. Claims 8 and 10 are canceled. Claims 14-19  
are introduced without adding new matter. Consideration of  
the currently amended application is requested.

## AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A wireless pointing device for a computer, the wireless pointing device capable of being charged by an induction power device, the induction power device comprising:

5 a base with a flat-plate; and

a first induction coil installed corresponding to a position of the flat-plate for transforming an electrical power of a power source to an induction magnetic field; and

10 the wireless pointing device comprising:

a housing with a contact plane corresponding to the flat-plate;

15 at least a control key installed on the housing for generating a control signal corresponding to a user's control;

a signal module electrically connected to the control key for transmitting the control signal through radio waves;

20 a second induction coil installed inside the housing corresponding to a position of the contact plane for receiving the induction magnetic field through the contact plane in a magnetic induction manner, an effective cross-sectional area of the second induction coil being smaller than an effective cross-sectional area of the first induction coil;

25

30 a power module electrically connected to the second induction coil for transforming the induction

5 magnetic field received by the second induction coil to a corresponding electrical power; and a storage module for storing the electrical power generated by the power module so that the storage module is capable of providing the electrical power to the wireless pointing device;

10 wherein when the contact plane of the wireless pointing device is put on the flat-plate of the induction power device, the second induction coil of the wireless point device receives the induction magnetic field generated by the first induction coil so that the wireless pointing device is capable of being charged by the induction power device.

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Claim 2 (currently amended): The wireless pointing device of claim 1 wherein ~~at least~~ a first fixer is installed in the induction power device corresponding to the position of the flat-plate, and ~~at least~~ a second fixer is installed on the contact plane corresponding to the first fixer, and when the contact plane of the wireless pointing device is put on the flat-plate of the induction power device, the first fixer brakes the second fixer so as to fix the position of the wireless pointing device and make the position of the first induction coil align with the position of the second induction coil.

Claim 3 (original): The wireless pointing device of claim 2 wherein the first fixer is a magnet.

Claim 4 (original): The wireless pointing device of  
claim 2 wherein the second fixer is a magnet.

5 Claim 5 (original): The wireless pointing device of  
claim 1 being a wireless mouse.

10 Claim 6 (original): The wireless pointing device of  
claim 1 wherein the computer comprises a receiving  
module for receiving the radio control signal  
transmitted from the wireless pointing device.

15 Claim 7 (currently amended): A wireless earphone for  
a broadcast system, the broadcast system emitting  
a radio broadcast signal, the wireless earphone  
capable of being charged by an induction power  
device, the induction power device comprising:  
a base with a flat-plate; and  
20 a first induction coil installed corresponding to  
a position of the flat-plate for transforming  
an electrical power of a power source to an  
induction magnetic field; and  
25 a first fixer installed inside the base;  
the wireless earphone comprising:  
a housing with a contact plane corresponding to the  
flat-plate;  
a signal module for receiving the radio broadcast  
signal of the broadcast system and generating  
corresponding music signal;  
30 a loudspeaker electrically connected to the signal  
module for playing the music signal;  
a second induction coil installed inside the

housing corresponding to a position of the contact plane for receiving the induction magnetic field through the contact plane in a magnetic induction manner;

5       a second fixer installed inside the housing for aligning the first induction coil with the second induction coil;

10       a power module electrically connected to the second induction coil for transforming the induction magnetic field received by the second induction coil to a corresponding electrical power; and  
15       a storage module for storing the electrical power generated by the power module so that the storage module is capable of providing the electrical power to the wireless earphone; wherein when the contact plane of the wireless earphone is put on the flat-plate of the induction power device, the second induction coil of the wireless earphone receives the induction magnetic field generated by the first induction coil so that the wireless earphone is capable of being charged by the induction power device.

25       Claim 8 (canceled)

Claim 9 (original): The wireless earphone of claim 7 wherein the first fixer is a magnet.

30       Claim 10 (canceled)

Claim 11 (original): The wireless earphone of claim

7 further comprising a microphone for receiving speech sound of users and generating a corresponding sound signal.

5 Claim 12 (original): The wireless earphone of claim 11 wherein the signal module is capable of transmitting the sound signal through radio waves, and the broadcast system is capable of receiving the radio sound signal.

10

Claim 13 (original): The wireless earphone of claim 7 being a bluetooth wireless earphone.

Claim 14 (new): An electronic device comprising:

15 a base with a surface;  
an induction coil installed corresponding to a position of the surface; and  
a fixer installed inside the base for aligning the induction coil of the magnetoelectric device  
20 with an external induction coil.

Claim 15 (new): The electronic device of claim 14 wherein the fixer is a magnet.

25 Claim 16 (new): The electronic device of claim 14 further comprising a power source coupled to the induction coil for supplying the induction coil with electrical power.

30 Claim 17 (new): The electronic device of claim 14 further comprising:  
a power module electrically connected to the

induction coil for transforming an induced magnetic field received by the induction coil to corresponding electrical power; and a storage module for storing the electrical power generated by the power module.

5 Claim 18 (new): The electronic device of claim 14 further comprising:

10 a control key installed on the housing for generating a control signal; and a signal module electrically connected to the control key for transmitting the control signal through radio waves.

15 Claim 19 (new): The electronic device of claim 14 further comprising:

20 a signal module for receiving radio broadcast signals and generating corresponding audio signals; a loudspeaker electrically connected to the signal module for playing the audio signals.

**Remarks**

## 1. Amendments of claims 1 and 2:

5 In claim 1 and 2, the phrases "at least" are deleted because "comprise a" already includes the embodiments of having "more than one". Further the phrase "an effective cross-sectional area of the second induction coil being smaller than an effective cross-sectional area 10 of the first induction coil" is introduced into claim 1 according to paragraph [0021]. This limitation would enable a user to move the wireless pointing device while charging the wireless pointing device by electromagnetic induction thus clearly differentiating claim 1 from the prior patent (Chinese 15 Patent No. 1049077C) cited by the SIPO of PRC. No new matter is introduced by these amendments. Consideration of the currently amended claims 1 and 2 is politely requested.

## 2. Amendment of claim 7:

20 The original claim 8 is merged into the original claim 7 to form the currently amended claim 7. Claim 8 is therefore canceled. No new matter is introduced by these amendments. Consideration of the currently amended claim 7 is politely 25 requested.

## 3. Introduction of claims 14 to 19:

30 The new claims 14, 17 and 18 are introduced according to the original claim 1. The new claim 15 is introduced according to the original claims 3 and 4. The new claim 16 is introduced according to the power source 30 in paragraph [0017] and Fig. 1.

The new claim 19 is introduced according to the original claim 7. No new matter is introduced. Consideration of the new claims 14-19 is politely requested.

5

Respectfully Submitted,

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